ATOMIC ENERGY newsletter

THE FIRST AND ONLY ATOMIC NEWS SERVICE

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Dear Sir:

The death in the last fortnight of Brien McMahon, senior United States Senator from Connecticut, and Chairman of the Joint Congressional Committee on Atomic Energy, ended, at the early age of 48, the career of a man who served the United States well. It was Brien McMahon who championed the civil control of atomic energy, and who guided the Atomic Energy Act (1946) through its perilous early days when military and civilian forces clashed over eventual control of atomic energy. The enormous strides made in atomic work, in this Nation, since the Act has been in effect, are a monument to Brien McMahon. The tragic and premature death of this most sincere, tireless worker for good, is a very distinct loss to this Nation.

Marketing of radioisotopes, produced at Chalk River, in the Canadian reactor there, and which has been handled in the past two years by Eldorado Mining and Refining, is now to be handled by Atomic Energy of Canada, Ltd. When radioisotopes became available from the Chalk River project several years ago, it was decided that the Commercial Products Div. of Eldorado would take on the responsibility of marketing them; this Commercial Products Division had been established in 1946 to handle the sale of radium products produced in Eldorado's refinery at Port Hope, Ontario. Now, with the growing importance of radioisotopes, Atomic Energy of Canada, Ltd., will handle both radioisotopes and radium. However, Eldorado will continue to market uranium, a large volume of which is purchased by the United States.

Cobalt-60, which is being so readily accepted in radiotherapy, has been under investigation at Armour Research Foundation for drug sterilization. In comparisons conducted at Armour, it was found that irradiation with the cobalt-60 surpassed treatment with x-rays, beta rays, ultraviolet rays, high energy electrons, and radioactive slurry as a means of killing unwanted bacteria. Simplicity and high efficiency of method make for economy, the researchers report, and sterilization is effected without cutting either the potency or shelf-life of the drugs treated. It was said that extending the technique to other products, such as foods, is "quite promising".

Development work on a nuclear power plant suitable for propulsion of large naval vessels, such as aircraft carriers, is now to be conducted by Westinghouse Electric Corp., under a recently awarded prime contract by the USAEC. The existing contract, between these two, which provides for nuclear devices, has been modified to include work on this new project. The work will be centered at the Bettis Plant, near Pittsburgh, Pa., operated by the Atomic Power Division of Westinghouse. Other Westinghouse divisions, and widespread sub-contractors, will assist.

Architect-engineer services on the aircraft nuclear propulsion test project (Page 4, this LETTER) at Arco, Idaho, are to be performed by Ralph M. Parsons Co., Los Angeles, under a contract recently negotiated by the USAEC with Parsons. The Parsons firm was selected after review of proposals from four firms to do the work on a lump-sum basis, although initially some 25 firms had been considered.

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ATOMIC ENERGY (U.S.) PROGRESS REPORT: January-June, 1952. A special digest, prepared for readers of this NEWSLETTER, from the 12th semi-annual report to Congress of the USAEC, and other sources.

RAW MATERIALS: Domestic Production- Enlargement of several of the existing uranium ore processing plants on the Colorado Plateau occurred, and further expansion is planned. At Shiprock, N.M., the new ore buying station operated by American Smelting & Refining is providing a convenient market for uranium ores produced in the Lukachukai area. Metallurgical research on these ores was done at the Watertown, Mass. laboratory, operated by the American Cyanamid Co., under a USAEC contract, and by the Bureau of Mines, Salt Lake City. At Grants, N. M., Anaconda Copper is constructing an ore buying depot, sampling plant, and processing mill to treat the ores produced in that area. Assistance was given uranium ore producers of the Colorado Plateau in opening up new uranium producing districts. Some $4,200,000 is being spent on new access roads to uranium areas; funds come under the Federal Aid Highway Act of 1950. Additionally, over $600,000 in bonus payments for initial production has gone to more than 450 uranium mining properties since inauguration of this bonus in 1951. Construction of the first plant for recovery of uranium from phosphoric acid is nearing completion by the Blockson Chemical Co., Joliet, Ill. , and initial production is expected this year. Pilot plant studies are underway at other locations to develop suitable processes for additional uranium recovery plants.

Foreign Production- The Belgian Congo continued as the major uranium ore supplier to the USAEC. In Canada, additional mill facilities at Eldorado Mining and Refining's Great Bear Lake operation went into production. The first of several plants being constructed in South Africa to recover uranium from the gold ores of the Rand is nearly ready to start production. In addition, an agreement was reached with Australia to supply uranium to the United States.

FISSIONABLE MATERIALS: Expansion- A considerable portion of the nearly $5 billion appropriated for the USAEC in fiscal 1953 will be used for the construction of additional fissionable materials production facilities. Uranium-235 production output will be upped through construction of new units at Oak Ridge, Tenn., Paducah, Ky., and in the Ohio River Valley. Plutonium output is to be increased by the construction of additional reactors at Hanford and Savannah River, with their necessary supporting facilities.

Construction Progress- At the end of the first six months of 1952, the construction status of major production facilities was as follows: The Feed Materials Production Center, Fernald, Ohio, was partially complete; National Lead Co. is the operating contractor for this center. At Paducah, Ky., the first units of the new gaseous diffusion plant will be completed later than originally scheduled; however, the last units are expected to be in operation at the dates set. Progress at the Savannah River Plant is rapid: 10,000 tons of structural steel have been erected, and one-half million cubic yards of concrete have been poured.

REACTOR DEVELOPMENT: Materials Testing Reactor- This reactor, constructed at the reactor testing station, Arco, Idaho, became critical March 31st, of this year, and in May was operated at full power. Operating contractor is Phillips Petroleum Co. Research, development, and preliminary design of this reactor, by the Oak Ridge and Argonne National Laboratories, cost about $13 million, while the actual building of it cost an additional $18 million.

Chicago Pile No. 5- Building to house this reactor was 85% completed the end of June; construction is at Argone National Laboratory's permanent Du Page County (Ill.) site. CP-5 will replace CP-3, which is at Argonne's temporary forest preserve site. Operation of the new reactor is scheduled to begin early in 1953; its cost, including the building in which it will be housed, will be about $2 million.

Raleigh Research Reactor- At the end of June, concrete shielding had been poured, and the building was being constructed, for this first non-AEC reactor, being built by the Consolidated Universities of N. C. on the campus of N.C. State College, Raleigh. Of the homogeneous type, with a maximum power of 10 kilowatts, the loading of the reactor is expected to begin in late 1952, or early 1953.

ATOMIC ENERGY (U.S.) PROGRESS REPORT: Jan.-June, 1952. (Con'td.

REACTOR DEVELOPMENT (Cont'd) (Military Propulsion Reactors)--Submarine Thermal Reactor: The keel plate was laid for the first nuclear powered submarine (USS Nautilus) in which the second version of the Submarine Thermal Reactor and power plant will be installed. Work continued at the reactor testing station, Arco, Idaho, on construction of the prototype reactor. This reactor power plant is being assembled in a section of a submarine hull, where it will be given thorough tests. Westinghouse Electric, the prime contractor, is developing the STR plants jointly with Argonne National Laboratory, and has the assistance of many industrial subcontractors. The Electric Boat Div., General Dynamics Corp., Groton, Conn., is building the submarine hull for the Navy; Westinghouse also will furnish propulsive machinery.

Submarine Intermediate Reactor: Construction of the land-based prototype of this reactor, and its power plant, began last February by General Electric, at Knolls Atomic Power Laboratory, West Milton, N.Y. The reactor and other equipment handling liquid metal coolant will be housed in a spherical steel building 225-feet in diameter, similar to structures widely used in the petroleum and chemical industries; the building will provide a measure of safety over and above that which the safety controls of the reactor provides.

Aircraft Nuclear Propulsion: Design and development work by General Electric's aircraft gas turbine department gained momentum during the last 6-months. Most of the G-E staff at Oak Ridge moved to the G-E plant at Lockland, where work on this project is centered. Meanwhile, investigations into various aspects of aircraft nuclear propulsion continued at Oak Ridge National Laboratory, while the Pratt and Whitney Division, United Aircraft Corp., E.Hartford, Conn., is doing reactor study and experimentation.

FISSON PRODUCT INVESTIGATIONS: Attempts to utilize fission products, the highly radioactive isotopes in the waste from the chemical processing of spent reactor fuel, had settled down to detailed study and investigation at some 10 locations. Two new projects were started during the past 6-months. The University of Chicago, in a program financed jointly by the American Meat Institute Foundation, the Food Research Institute, and others, is using a 1.5-kilocurie source to investigate the possibility of cold sterilizing meat and other food products. Rensselaer Polytechnic Institute, Troy, N.Y., using a low-level, beta-emitting source prepared at Oak Ridge, began investigating the possibility of utilizing fission products to promote certain chemical reactions.

RESEARCH: Research under USAEC sponsorship is conducted in physics, the biological sciences, and medicine. Major research and development centered in universities, private research institutions, and industrial organizations. Fundamental research into the atomic nucleus, which is essential to the long-range progress of the atomic energy industry, is of especial urgency. Investigations continue at all the national laboratories, and at many universities, on such properites of the nucleus as magnetic moments, beta- and gamma-ray spectra, internal conversion coefficients, and on the production and use of mesons.

FINANCE: During fiscal 1952 (ending June 30, 1952) the USAEC received three appropriations totaling $1,605,897,750. For 1951, its budget was over $2 billion; in 1950 it was approximately $700 million; and in 1949 approximately $621 million. The initial appropriation for fiscal year 1953 amounted to $1,137,727,500. To meet the demands of the large expansion, Congress made a supplemental appropriation of $88,094,000 for operating expenses, and $2,898,800,000 for plant and equipment. In order to better follow fund expenditures, the 1953 funds for the first time were broken down into separate appropriations: operating expenses and plant and equipment.

PATENTS: The total number of patents (developed in the course of nuclear investigations) made available to industry as of May 31st, 1952 was 425. Over 235 licenses to use these patents have been issued since the program began in January 1950.

ISOTOPES: Since the isotopes distribution program began in August 1946, about 27,000 shipments of radioactive isotopes have been made to 922 institutions in the U.S., and more than 1900 shipments of stable isotopes have been made to 250 domestic institutions. More than 1400 shipments of radioisotopes have been made to 34 foreign countries.

AT ATOMIC CENTERS...important new developments...

National Reactor Testing Station, Arco, Idaho- New facilities for the ground testing of nuclear powered aircraft are now to be built at this station, an indication that the development by the U.S. of this type aircraft is considered feasible by those intimately associated with this project. The new facilities are estimated to cost $33,000,000, with construction scheduled to begin this Summer. During the peak of construction about 1,000 construction workers will be employed. Preliminary design studies for this ground test station have been performed by Parsons-Macco-Kiewit, Los Angeles, under a sub-contract with General Electric. The design, development, and fabrication of the prototype aircraft propulsion reactor are being done by G-E's aircraft gas turbine department, at Lockland, Ohio, under a prime USAEC contract. These nuclear phases of the project parallel the development of associated non-nuclear devices by G-E, working under an Air Force contract. The airframe, which of necessity must take into account the high wing load factors imposed by the nuclear reactor, its power plant, the shielding provided for the crew, etc., is being designed by Consolidated Vultee, working in close liaison with G-E, and the Air Force. Design and construction of the ground test facilities will be administered by the USAEC's Idaho Operations Office. The USAEC's Chicago office, because of the large involvement of Argonne National Laboratory in the reactor problems, will continue to have responsibility for the reactor development contract with G-E. Support in nuclear design and development is also being furnished by the Oak Ridge National Laboratory.

Hanford Plutonium Works, Richland, Washington- Negotiations have now been completed with Kaiser Engineers Division of Henry J. Kaiser, Oakland, Calif., by the USAEC's Hanford office, under which Kaiser Engineers will construct a large part of the new expansion program on the plutonium-producing project here. Contracts for designing the new plants have been signed with Vitro Corp. of America, New York, and Charles T. Main Company, Boston. General Electric, the prime operating contractor at Hanford works, will furnish basic engineering design for the program, and will do complete design of certain very complex features of the expansion. Kaiser Engineers is scheduled to begin work late this Fall, with hiring of construction workers starting around September 15th. The maximum construction force required for the total new expansion program, including the work to be done by Kaiser, is expected to be approximately 11,000. This peak will be reached late in 1953, or during the first half of 1954. To be divided into two or more parts, the new expansion program will get underway just as the present construction phase nears completion.

Oak Ridge, Tennessee-Polonium 210, the first reactor-produced radioisotope to be sold which emits alpha particles, may now be purchased at Oak Ridge for research activities. It is felt that the newly available polonium will be useful to research groups for physical and biological investigations. The isotope, which is also a source of high energy neutrons, may be used in oil well logging and for ionization purposes. In addition, the element is useful (although it is not as yet immediately available) for luminous phosphors, static detection devices, etc. The polonium can be bought at Oak Ridge National Laboratory in two forms. When it is to be used as a neutron source, the polonium will be mixed with beryllium and enclosed in a cylinder of nickel, about 3/4-inch in diameter. As an alpha source, the polonium will be plated on a strip of platinum. It is pointed out by the Laboratory people, who produce this polonium, that since it is produced in a reactor by the neutron bombardment of bismuth, it is of higher purity than the polonium (as previously available) derived from the radioactive decay of radium.

A new method of analysis of various materials, by means of neutron activation, is now offered as a service to industry by Oak Ridge National Laboratory. Research personnel at ORNL have found that this neutron activation method of analysis detects and measures many chemical elements occurring in traces so slight they cannot be identified by usual quantitative analysis procedures. The technique involves irradiating the sample in the Oak Ridge graphite-uranium nuclear reactor. Since the radiation characteristics of the isotopes (of the impurity being sought) are not duplicated by any other isotope, they may be precisely measured by instruments, permitting identification of the material and the determination of quantity. As little as 7/1000 of one-millionth of a gram can be measured within an accuracy of 10 per cent, the Laboratory claims.

RAW MATERIALS...new finds & developments...

CANADA-In the exploration program which Eldorado Mining & Refining is carrying out on the Radiore property, the first diamond drill hole has now been started. It is located in the northwest section of the Radiore holdings, and will go to a depth of at least 1,000 feet. Eldorado is carrying out the exploration of the Radiore claims and the Bolger section of its own property as a joint project. On its Con group, which Radiore still controls, it not being included in the deal with Eldorado, Radiore has had a crew of men at work for some time engaged in surface mining and bagging high grade uranium ore from several open cuts in the No. 3 area. A grade of approximately 0.45% uranium oxide ($66.25 per ton) is being maintained. The ore is being stockpiled for shipment to the Eldorado mill for treatment when the plant is completed.....Eighteen drill holes, for a total of 3,893-feet, have been put down on three groups at Charlebois Lake Uranium Mines, in which New Alger Mines has a 12½% interest. Charlebois holds 154 claims in 10 groups, in the Lake Athabaska area, Northern Saskatchewan. Drilling this year is going deeper than last year at Charlebois, New Alger shareholders were recently advised.....With what the company describes as "encouraging results", initial drilling on American Canadian Uranium's Tom 7 fault has been completed. The company's property is in the Athabaska area, N. Saskatchewan. Seven holes to about 100-ft. vertical depth indicated an average grade of 0.145% uranium oxide across an average width of 3.6-feet for a 300-ft. length, it is said.

AUSTRALIA-A greatly intensified search for uranium minerals will be made in Australia, according to William H. Spooner, Minister for National Development. Mr. Spooner said more reliance will be placed upon aircraft equipped with detection devices.

PRODUCTS, PROCESSES & INSTRUMENTS...for nuclear work...

Dosimeter, indicating total gamma radiation by color change, for personnel use. Called the "Atometer" by its maker, the device is 2-inches long, 3/4-inch thick, and weighs 1-oz. It contains the chemical solution which changes color upon exposure to gamma rays. The degree of such exposure is determined by comparing the color of the liquid with a color chart printed on the outside of the device.--Magnex Corp., Jamaica, N. Y.

Simple, low-cost basic scaler, for laboratories interested in entering the field of radioactivity. Intended primarily for laboratories wishing to inaugurate a program with a minimum of cost, this model SC-19 utility scaler incorporates an electronic scale of 256, a wide range preset count selection and a high voltage power supply for Geiger tubes. The instrument uses eight electronic scales-of-two, giving a scaling factor of up to 256, followed by a mechanical register. A scale selector switch allows the choice of four scaling factors of 32,64,128, and 256. Total number of counts accumulated is obtained by multiplying the register reading by the selected scaling factor, and adding the values of the neon interpolating lights. Predetermined counts ranging from 320 to 256,000 may be selected by means of a preset count switch which will stop the register at 10, 100, or 1000.--Tracerlab, Inc., Boston 10, Mass.

NEW BOOKS & OTHER PUBLICATIONS...in the nuclear field...

Supplement No. 3 (Nuclear Data), covering period Jan-July 1951. This is the most recent supplement to National Bureau of Standards circular 499, containing tables of experimental values of half-lives, radiation energies, relative isotopic abundances, nuclear moments, and cross sections. Nuclear Data is obtainable only as a set, comprising Circular 499 (310 pges.) and the three Supplements.--Superintendent of Documents, Washington 25, D.C. ($4.25)

Dictionary of Civil Defense; edited by Carlton Wallace, A highly useful and well arranged handbook (for Civil Defense people) of such subjects as atomic bomb and its effects; gas attacks; shelters; standards of protection; sand-bagging principles; etc.--Philosophical Library, Inc., 15 E. 40th St., New York 16, N.Y. ($2.75)

Sincerely,

The Staff,
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